seconds before having power returned, the second priority appliance, with its interrupt switch 20 set to priority two, waiting 30 seconds and the third priority appliance, with its interrupt switch 20 set to priority three, waiting 45 seconds, etc. In this scenario, the load of the first appliance in addition to any manual appliances or lights left on in the facility, is assumed to be less than half the full load capacity of the generator. The addition of the second priority appliance at the 30 second mark, is considered appropriate for the engines capacity at the time since engine start. The addition of the third priority load with all those allowed prior, occurs at the 45 second mark when the engine manufacturer recommends full load can be applied. Alternative equations for step 270 are equally applicable to the principle of the present invention, for example, a wait period of:

$$T\varnothing + (T2 * \text{Priority}),$$

Where the wait period $T\varnothing$ is perhaps the full 45 seconds the engine manufacturer recommends before applying full load. This would be useful if the electric load of the lights, clocks and other appliances, not on interrupt switches, are equivalent to, or near, the half total load recommended after 15 seconds. Following the 45 second period of $T\varnothing$, the value of T2 may be on the order of 1 or 2 seconds allowing the appliances coupled through interrupt switches 20 to be activated much more quickly, once the generator is warmed up to the point where it is capable of supporting its full rated capacity.

In the case of a fuel cell generator, the warm up time can be much longer than that of a generator powered by a combustion engine. A fuel cell generator can take several minutes to warm up to the point where it can produce its full rated power. In this case a process for step 270 can create a longer and more gradual set of delays for the different priority appliances on interrupt switches, commensurate with the fuel cell generator's capability during the initial start up phase.

After appliance loads have been delayed sufficiently to allow the generator to warm up, the interrupt switch's 20 control system moves on to step 271 where the GAP levels are

received from the generator monitor 10. The interrupt switch 20 evaluates the GAP levels by comparing them to the observed surge load and continuous load of the connected appliance in steps 272 and 275. If either the surge load or continuous load of the appliance are greater than the GAP levels received, then the control system moves along either path 274 or 276 to process step 286. At step 286 the interrupt switch 20 keeps the power switch open, depriving the appliance of power, and the interrupt switch 20 transmits as in 18a or 18b of Figure 1, either its unique interrupt switch ID or its assigned Switch Priority 231 in figure 4, along with its "Switch Open" status. The "Switch Open" status may, for example, be received by a user display, for additional reporting that is explained below in the detailed user display section. The control system then proceeds to step 294 to set the time reference to now, or to zero. The time reference is used to measure the wait period based on the interrupt switch 20 priority, during which the GAP levels must remain sufficient in order for the decision process to return power to the appliance. The control system proceeds to step 287 to receive the next GAP level transmissions from the generator monitor 10. These GAP levels are checked in step 288 and 291 to determine whether the observed surge and continuous loads of the appliance are less than the GAP levels received. If the GAP levels are less than the appliance surge load and continuous load, the control system proceeds along path 290 or step 292 and returns to step 294 to reset the time reference to now or zero, and then proceeds to 287 to repeat the previous GAP level check. When the GAP levels are both higher than the surge and continuous loads of the appliance, then the control system passes through step 288, along path 289, to step 291 and along path 293 on to step 295 where the current time minus the time reference is compared to the time value of T3 times the interrupt switch 20 priority. This process step 295 determines whether or not the interrupt switch 20 has waited its unique wait period, which is equivalent to the time interval T3 times the switch priority. The time interval T3 is on the order of, or a little longer than, the response time of the system as listed in the description of the generator monitor 10. If this time period for which the GAP levels have been sufficient to support the appliance is not greater than the unique wait period dictated by the interrupt switch 20 priority, the control process returns via path 296 back to step 287 to receive the next GAP level transmissions. Note that process block 294 is bypassed and the time reference is not reset. The GAP levels go

10409050.062706

through the same check process via step 288 and step 291 again. If an appliance on a higher priority interrupt switch 20 has been enabled and the appliance activates, applying its load to the generator, then the momentary load (ML) measured by the generator monitor 10 increases and the transmitted GAP levels decrease. The decreased GAP levels may not be high enough for the control system of this switch to pass the tests in steps 288 and 291. If this occurs, the control system returns via path 290 or 292 and then to step 294 to reset the time reference to now or zero and begin the process again. However, if the GAP levels remain high enough to support the observed surge and continuous loads for the appliance, then the control system proceeds again through path 288, 289, 291, 293 to 295 to determine whether the time that has passed since the time reference, is greater than the wait time "T3 * Priority". If this wait time is greater than T3 * Priority, then the control process continues via path 297 to step 271 to check the GAP levels one more time and if still sufficient, goes through steps 272, 273, 275 and 277 to 278 where the Switch ID or Switch Priority Number is transmitted with a "Switch Closed" status followed by the control process going to step 279 where the switch is closed and power is provided to the appliance.

Once power is returned to the appliance, the system maintains power to the appliance as long as it is running and applying an electric load. This process follows the path of step 280, step 281, path 283 and back to step 280. The wait period of T3 in 280 is on the order of the response time of the system, and is intended to allow an automatic appliance the time necessary to recognize when it has power and then to activate and apply a load if needed.

The logic behind the condition of maintaining power to a running appliance is that the appliance load is either on or off and when it is on, it cannot turn on again and apply its electric load a second time. The system of the embodiment of the invention accounts for the load of an operating appliance in the generator monitor's 10 measurement of momentary load (ML). The system therefore does not interrupt power to an operating appliance that is applying its highest continuous load, as the appliance load cannot increase and incur the risk of overloading the generator and tripping the circuit breaker.